REMARKS

The Abstract has been amended to be shorter in length as required in the office action.

Claims 1 and 16-27 have been canceled. Claims 2-15, 28-35, 37-45, 48-58, 60-76, 78-83, 85-98, 100-110, 113, 114, and 117-121 have been amended, new claims 122-173 have been added, and claims 36, 46, 47, 59, 77, 84, 99, 111, 112, 115, and 116 are unchanged. The application now includes claims 2-15 and 28-173 for a total of 120 total claims of which claims 28, 51, 85, 122, 130 and 141 are independent claims.

There should be a fee of $100 for one additional independent claims, a fee of $975 for thirty nine (39) additional total claims, as well as a fee of $60 for a one month extension of time which are due in this case. A check in the amount of $1135 is attached to satisfy these fees, and if any further fees are due to grant the petition for an extension of time, or to gain entry and consideration of the amendment, the Commissioner is authorized to charge attorney's deposit account 50-2041 (Whitham, Curtis & Christofferson, P.C.).

The undersigned raises to the Examiner's attention the claims in the applicant's co-pending U.S. application serial no. 10/287,026 (see, for example, claim 575 and claim 718 which specify the use of moveable client computers). It is noted that the claimed subject matter differs between the present application and U.S. Serial No. 10/287,026. Consideration of the co-pending application in the next office action will be appreciated.

With the amendment to the specification, the only issue outstanding is the rejection of all claims for obviousness over SMT Plus 1.0 User's Manual authored by Skidmore et al. (it being understood that Dr. Skidmore and Dr. Rappaport are inventors on the present application) and U.S. Patent 6,456,938 to Barnard. The rejection is traversed in view of the amendments above and remarks below.

The present invention provides a system and method which allows unmanned, autonomous, fixed operation of a remote measurement system that communicates with a server. In addition, among other things, the invention contemplates enabling trained or untrained personnel to go into a site where a

communications system is installed or will be installed, walk around the site measuring performance metrics, position-location readings or related measures, or make changes in components which will be used in the communications network (e.g., the type of component, the settings for the component, the location of the component, the orientation of the component, etc.) and determine the impact of these changes on communications network performance, and to upload these measurements, changes, or updated predicted performance calculations to a server computer or computers. In this way, the computerized model, which provides a representation of the physical environment (preferably in, but not limited to, 3D), can be updated and the refined for design, management, and optimization purposes. Predicted performance results or measured performance metrics can be downloaded to portable computers (which may be carried by personnel, or be placed in fixed locations, or be operated autonomously) or uploaded to the server or another computer from the portable computers. The measurements, predictions, network information, or performance data can be shared among several server computers or portable computers or other computers. In this way, the communications network can be designed, modified, or optimized more easily before, during or after installation, or an installed communication network can be more easily optimized and managed after installation (such as in the case when a neighboring source or jammer interrupts performance, or when the walls of a building are re-configured, or when the network equipment is reconfigured, and the reconfiguration affects performance, etc.).

The SMT Plus 1.0 program was created several years prior to the present invention by some of the same inventors of the present application. It provides for a presenting a site specific representation of, for example, a floor plan at a computer workstation. The user is able to pick and choose potential antennas that might be used in the space, and to represent locations of the antennas in the space. Figure 4.3 on page 24 of the SMT Plus 1.0 program manual shows examples of coverage contours which are predicted by the program based on the floor plan, choice of components and placement of components. Figure 5.10 on page 32 of the SMT Plus 1.0 program manual shows the predicted effect on coverage contours in the presence of interference source.

SMT Plus 1.0 lacks, among other things,

a) servers and clients;

b) the ability to upload or download measurements and/or predictions between servers and clients so as to update, build, or revise a computerized representation of a communications network;

c) the ability to upload or download predictions or new measurements of network performance which may be processed or analyzed remotely and shared between servers and clients or other computers;

d) the ability to alter a computer generated model representing a physical environment from a remote client or server;

e) the ability to communicate site specific information such as network information or measured or predicted performance data between clients and servers;

f) the ability to show markers or statistics on a building drawing that indicates differences between predicted/simulated data and actual measurement data based on remote measurements;

g) the ability to use, with servers or clients, a position-location system to display and indicate users locations for one or more client computers in an environmental map; and

h) the ability to make measurements with one or more client computers or measurement devices and to send them to a server, where the measurements are correlated with position information.

These features enable many capabilities, including on-the-fly changes to be made while designing, surveying, maintaining, or displaying a communications network, and to have those changes represented in a computerized database model representing the facility. For example, a person carrying a client computer through a facility may make a measurement in a particular location (e.g., a room of a building), and find that the measurement is lower than the predicted metric. When this occurs, the measured information could be updated to the server. In addition, the person could perform prediction calculations at his or her client computer to determine the effect that changing the settings of a component, changing the position or orientation of a component, etc., would have on the performance metrics at that location and throughout the environment (e.g., the building). Alternatively, the client computer may receive such prediction

calculations or performance metrics from the server. Based on this analysis, the person could then choose to take corrective action right there in the field, and to upload these changes and predictions to the server. Alternatively, the person could decide not to take any corrective action, in which case, the server will have been updated with the measurement, and this measurement information could be used for future analysis and optimization of the communications network. Note that the invention also contemplates unmanned operation, or passive or autonomous operation, as well as the clients being placed in fixed locations. Thus, instead of being used by a human, the invention also considers remote, unattended operation using fixed or stationary or unattended computers or measurement devices.

The SMT Plus product is not designed to allow multiple users through a client server network to add to, revise or refine a site specific computerized model of a communications network that is or will be deployed in a particular physical environment. Rather, SMT Plus allows a user to model an environment (e.g., a floor plan), and to place antennas at various locations in that environment, and to predict contours of how these placements would affect performance within the environment. However, it was not designed to work in a client-server arrangement, and does not contemplate sharing of measurement data, or prediction data, or network component data between clients and servers. The claimed invention provides a much more robust solution for today's wireless networks and communications network designers which allows for on-the-fly changes and efficient design, deployment and optimization of wireless networks. Also, the present invention explains measurements that are correlated with position information that can be shared between one or more clients, server computers, or other computers.

The Barnard reference describes a personal GPS golf course cartographer, navigator system with an internet based map exchange. As is shown, for example, a user can produce a map of a golf course by walking the perimeters of its fairways and greens taking periodic global positioning measurements (see, in particular, Figure 3 of Barnard which shows the outline of a green being traced at multiple location detection points 29). The user can also track and map the locations of hazards (Figure 12 shows the ability to identify trees, rocks, mounds,

water, etc.). The information which the golfer collects can then be shared with other golfers (Figures 4a-e of Barnard show the ability to download previously mapped golf coursed). Figure 17 shows that the user can, using the system, locate him or herself on a fairway (hopefully), and determine how far from the green or pin he or she is using global positioning technologies. Because of the prior mapping, he or she can look at a screen such as that shown on Figure 17, and determine the location of water hazards, bunkers and other impediments. The golfer is also able to track scores, club selections, etc.

As best understood by the undersigned, Barnard has been relied upon for its showing of the use of PDAs (by golfers) in a global mapping and information sharing system, and it has been suggested that the SMT Plus system could be combined with Barnard to make the claimed invention obvious. However, the claims, as amended, would not be obvious over such a combination.

The combination proposed by the Examiner could possibly permit location tracking of an individual within a building (see Barnard). This may assist in locating a client computer in a building. However, at no point do either SMT Plus or Barnard suggest making a communications network performance measurement at a location (such as signal strength), and having that measurement information for that location be uploaded from a client to a server so as to modify and refine a computerized representation of the physical environment. Further, any combination of SMT Plus and Barnard would not contemplate or suggest a technician in the field being able to make prediction calculations for various communications network performance metrics on a client computer for changes he may or may not make in the communications network, and, if changes are made, to upload those changes and predictions to a server computer. Furthermore, any combination of SMT Plus and Barnard would not contemplate the remote analysis or processing capabilities whereby remote measurements or predictions or changes in network component layouts would enable more accurate simulations, or predictions or network performance or measurements for use at remote clients (e.g., improved bit error rate, RSSI, throughput, position-location information, etc.). Barnard merely allows for changes in locations of objects to be accounted for (e.g., the pin position may change daily, and the size of bunkers and the path of streams may also change with time), but Barnard does not contemplate changes in

performance metrics of any kind based upon changes in location. Moreover, no combination of SMT Plus and Barnard would contemplate or suggest being able to upload and download predicted performance metrics and measurement data between clients and servers as well as between additional client computers. For example, the described and claimed invention would allow a technician on floor 3 of a building to make a change in cable, antenna or other components, and this change would be incorporated into the computerized model at the server and be provided to a technician on floor 10 of a building, so that when he or she is contemplating changes or making measurements, he or she will be able to account for the change which was made on floor 3. While Barnard tracks location, it does not measure performance metrics such as bit error rate, signal to noise ratio, position-location accuracy, etc. (there would be no need to do so in Barnard, as the location of a person and the location of targets and obstructions are all that are required to enjoy the Barnard system). Thus, no combination of SMT Plus and Barnard would make independent claims 28, 51, 85, and 122 obvious, all of which require use of a measurement device to measure performance measurements or metrics and to communicate these to either or both the portable computer or server computer, where these measurements or metrics can compliment or be used by the computer generated model which provides for performance prediction of the communications network. Further, with respect to independent claims 130 and 141, Barnard does not show or suggest making a performance prediction calculation at the PDA. Rather, all Barnard shows is being able to locate the PDA using global positioning technology, and to relate that position to an attribute (fairway, green, tree, bush, etc.). As noted above, SMT Plus does not use portable computers in conjunction with servers. Thus, no combination of SMT Plus and Barnard, would contemplate, suggest or make obvious the ability to make a change to various factors in a communication network (e.g., choice of component or location of component, etc.), and to make performance predictions based on those changes using a portable computer, and then to update the computerized model based on the changes or predictions. Claims 130 and 141 specify that the portable computer has the ability to compute performance predictions based on changes and to upload these new performance predictions to a server. Clearly, this is not obvious over a combination of SMT Plus and Barnard.

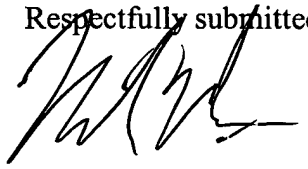
Many other features are also not obvious over the combination proposed by the Examiner. For example, neither reference contemplates a network performance measurement device associated with or connected to the portable computer; neither reference contemplates transmission of predicted or measured performance metrics between computers; neither reference contemplates performing comparisons of predicted and measured performance on a building drawing; neither reference contemplates the ability to modify a computerized model representing a physical environment with network components while efficiently tracking the changes and sending such changes between a client and server; and neither reference contemplates a bill of materials and sharing cost information amongst clients and servers.

In view of the foregoing, it is respectfully requested that the application be reconsidered, that claims 2-15 and 28-173 be allowed, and that the application be passed to issue.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

A provisional petition is hereby made for any extension of time necessary for the continued pendency during the life of this application. Please charge any fees for such provisional petition and any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 50-2041 (Whitham, Curtis & Christofferson).

Respectfully submitted,



Michael E. Whitham
Reg. No. 32,635

Whitham, Curtis & Christofferson, P.C.
11491 Sunset Hills Road, Suite 340
Reston, VA 20190

Tel. (703) 787-9400
Fax. (703) 787-7557

Please associate this
Application with
Customer No. 30743